

Statement of Tracy Woodard

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Nissan North America

Hearing on Expiring Tax Provisions

Select Revenue Subcommittee

Committee on Ways and Means

May 10, 2012

Chairman Tiberi, Members of the Committee:

On behalf of Nissan North America, I appreciate the opportunity to submit this statement for the record, in support of the extension of federal tax incentives to promote widespread consumer adoption in the U.S. of plug-in electric vehicles (EVs).

In particular, we urge you and your committee to support the extension of the consumer tax credit under Internal Revenue Code section 30C, which provides a credit of 30 percent of the cost of installing electric vehicle charging equipment, capped at \$1,000 per location for installations for personal use, and \$30,000 per location for commercial installations. At a time when EVs have only just recently come to market, the expiration of the section 30C consumer tax credit has been particularly ill-timed, and we hope that Congress will extend this credit as soon as possible.

#### Background

Nissan is a global automobile manufacturer offering a full line of light-duty vehicles in the U.S. and throughout the world. Nissan currently has three production plants in the U.S. – in Smyrna and Decherd, Tennessee, and Canton, Mississippi. Production at Nissan's Smyrna plant began in 1983. Nissan also has facilities in Irving, Texas, Farmington Hills, Michigan, and San Diego, California. In total, Nissan North America has approximately 13,000 employees in the U.S.

Nissan began selling the all-electric Nissan LEAF in early 2010. To date, we have sold more than 12,000 Nissan LEAFs in the U.S. and 28,000 Nissan LEAFs globally. The Nissan LEAF is

not a niche vehicle – it is a full-service family sedan designed for range, functionality, and safety. The Nissan LEAF is a Top Safety Pick by the Insurance Institute for Highway Safety and the first all-electric car to earn an overall 5 star safety rating from the National Highway Traffic Safety Administration. Nissan believes it is clear that EVs offer the potential to radically change our nation's transportation sector in a way that will result in numerous benefits for the country as a whole.

First, the widespread adoption of EVs will enhance our nation's energy security by reducing our reliance on foreign oil. Today, the U.S. imports nearly 50 percent of the oil consumed in this country. A recent symposium report issued by the Massachusetts Institute of Technology (MIT) suggests that oil dependence, price volatility and the setting of global oil prices by cartels has cost the U.S. economy \$5.5 trillion since 1970.<sup>1</sup> And, we continue to spend \$300 billion yearly to import foreign oil, representing 50 percent of our nation's trade deficit.

Second, electric vehicles offer the potential for significant long term cost savings for American consumers. With gas prices close to \$4 a gallon, an American family that drives less than 40 miles a day — which is most families — and switches to an electric vehicle, can save \$1,400 a year. Put another way, traveling on electricity costs 2 to 3 cents per mile, compared with 15 to 16 cents for gasoline.

Third, plug-in electric vehicles are cleaner for the environment. The Nissan LEAF is a zero emission vehicle. It has no tailpipe. Even when upstream emissions are considered, plug-in electric vehicles are considerably cleaner than even the most efficient conventional internal combustion engine vehicles. Recent analyses demonstrate that as the nation's electricity generation profile continues to get cleaner over time – utilizing more renewable and natural gas generation – the environmental benefits of using plug-in electric vehicles grow even more significant.<sup>2</sup>

Fourth, EVs represent a growing industry in the U.S. with great potential for further job creation and innovation. This industry already supports tens of thousands of U.S. jobs in manufacturing, battery technologies and infrastructure at some 300 facilities in the U.S. Component and vehicle manufacturing is spread across the country, in California, Indiana, Michigan, Missouri, North Carolina, Tennessee and other states. Production of the Nissan LEAF is scheduled to begin in Smyrna, Tennessee, in early 2013. We are also building an advanced battery production plant adjacent to the vehicle assembly plant in Smyrna, which is expected to be completed in late 2012 and will be capable of annually producing 200,000 advanced batteries. In total, our company's electric vehicle related initiatives are expected to result in the creation of up to 1,300 U.S. jobs. And, as the EV market continues to grow over time, these job numbers will grow.

#### Importance of U.S. Involvement In Encouraging EV Market Development

Smart, strategic government policies have helped accelerate the early success we have seen in the electric vehicle market. This is consistent with other success stories in which U.S. government support was critical to the growth of other strategically important industries, such as

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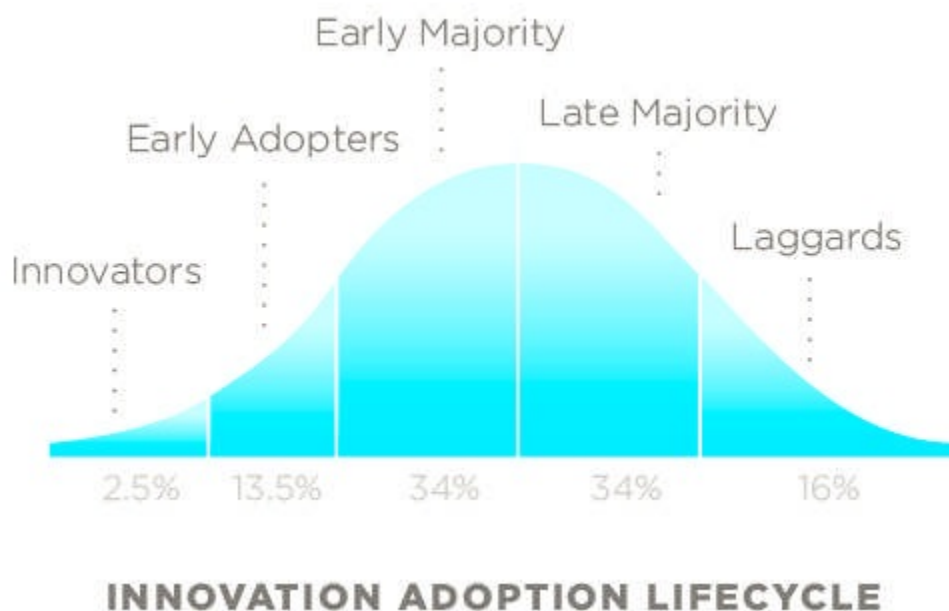
1 <http://web.mit.edu/mitei/docs/reports/electrification-transportation-system.pdf>

2. [http://www.ucsusa.org/assets/documents/clean\\_vehicles/electric-car-global-warming-emissions-report.pdf](http://www.ucsusa.org/assets/documents/clean_vehicles/electric-car-global-warming-emissions-report.pdf)

the intercontinental railroads and the aerospace industry. Investments in electric drive are no different. There is a clear national interest in using domestic electricity in our vehicles to reduce dependence on oil, increase energy security, encourage job growth and drive savings at the gas pump.

Significant challenges, however, still exist for this industry. The electric vehicle market in the U.S. is still in its infancy, and the continued availability of federal consumer tax incentives is critical to helping this industry grow to the point where it becomes self-sustaining. Nissan anticipates that battery electric and plug-in hybrid vehicles can achieve a significant market share if supported by government programs and incentives.

In order for new a technology—especially technologies that disrupt the status quo—to be adopted on a meaningful scale, it is essential that the new technology be adopted by a critical mass of consumers. While some new technological innovations diffuse from first use to widespread adoption in a matter of years, others may level out at less than 2 percent. *See generally*, Everett M. Rogers, *Diffusion of Innovations* 219 (Free Press 5<sup>th</sup> ed. 2003) (1962). A widely used depiction of the technology adoption curve is the “Innovation Adoption Lifecycle” developed by Joe M. Bohlen, George M. Beal, and Everett M. Rogers at Iowa State University:



*See, Diffusion of Innovations* at 281.<sup>3</sup> As the bell curve shows, new technologies begin with a relatively small number of “innovators,” then move to “early adopters” before possibly finding

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3. The theories presented in *Diffusion of Innovations* are widely accepted. *Diffusion of Innovations* is “the second most-cited work in social science after Cook and Cambell’s (1979) treatise on quasi- experimentation.” Arvind Singhal & Sweetie Law, *A Research Agenda for Diffusion of Innovations Scholars in the 21st Century: A Conversation with Everett M Rogers*, 8 J. Develop. Comm. 39, 39 (1997). *Diffusion of Innovations*.

acceptance within the pragmatic majority of consumers. Most of the variance in the rate of adoption of innovations is explained by five attributes: relative advantage, compatibility, complexity, trialability, and observability. *Id.* at 221.

Because federal EV tax credits under sections 30C and 30D are targeted to consumers, they are perfectly tailored to achieve the goal of moving consumers – and thus the market – forward on the curve, to encourage consumers to accept innovation and adopt new technology sooner because of temporary government encouragement.

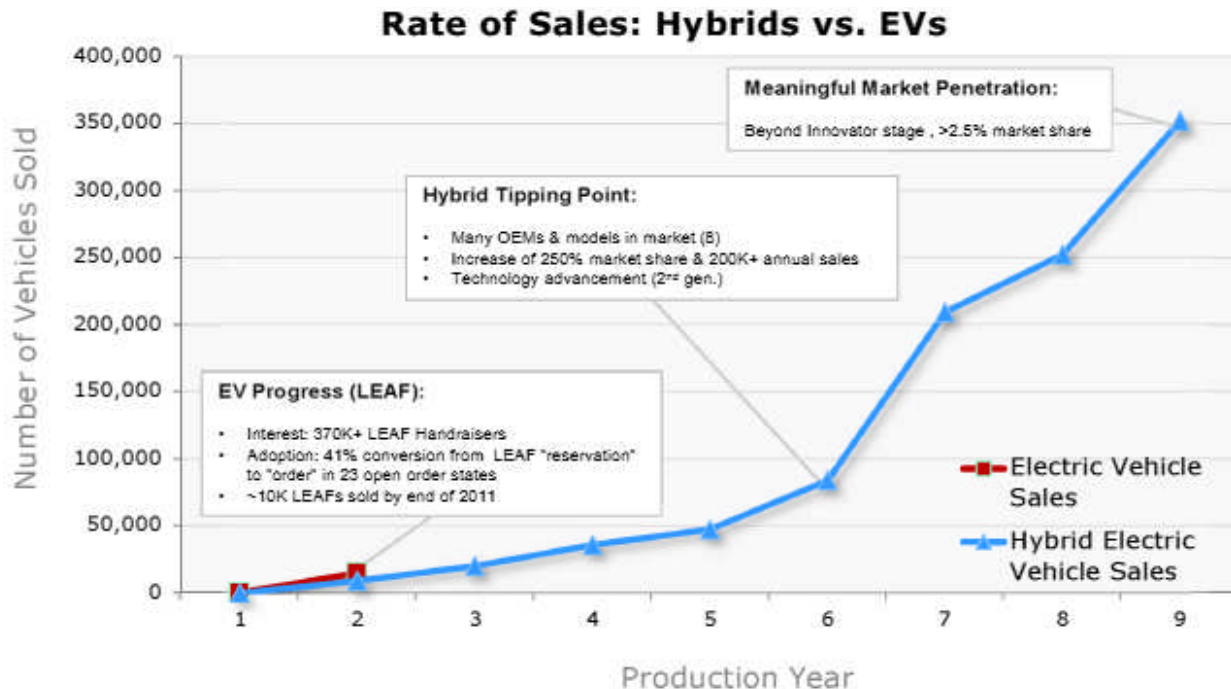
As applied to many consumer markets, a disruptive technology is likely to displace more traditional technology as it moves along the adoption curve to reach the pragmatic majority of consumers. As applied to the motor vehicle market, however, the goal is not for electric drivetrains to displace internal combustion engine vehicles, but rather for electric vehicles to gain enough of a foothold in the marketplace to be able to share the market with more traditional drivetrain technology.

A disruptive technology has the best chance of broader adoption when “opinion leaders adopt, which usually occurs somewhere between 3 and 16 percent adoption in most systems.” *Id.* at 223. The early adopters are the opinion leaders in communities, and potential adopters of a new technology look to them for advice and information. *Id.* at 283.

The Innovation Adoption Lifecycle represents what is necessary to enable EVs to move from innovators to early adopters in order to gain enough of a foothold to, over time, find acceptance among early members of the more pragmatic majority. In this context, government incentives will help EVs make the critical move from the approximate 2.5% of the market where innovators are willing to experiment with the new technology to the next group of consumers where early adopters showcase the practical use of the technology and begin the process of incorporating the technology into the broader market.

Since the motor vehicle market needs to be supported by substantial infrastructure and involves substantial investment and up-front costs, movement along the technology adoption curve is substantially slower and more precarious. Hybrids, for example, while gaining general acceptance as a viable drivetrain, have only just reached a consumer market share where they have transgressed beyond innovative consumers to more widespread early adopters.

The chart on the following page depicts the rate of Hybrid Electric Vehicle (HEV) sales from when they were first introduced in 1999 through 2007, and also depicts where EVs are on that same production schedule:



The first hybrid Honda Insight was introduced in the U.S. in 1999 and the first Toyota Prius was introduced in the United States in 2000. HEVs comprised only about 0.5% of new car sales during the first generation of these vehicles; and, as of 2004, only five HEV models were available. In 2005, Congress enacted consumer tax credits for HEVs of up to \$3,400. (Prior to this, consumers had been allowed a federal tax *deduction* of up to \$2,000 associated with the purchase of a HEV.) HEVs then reached a key tipping point, increasing their U.S. light-duty vehicle market share by 250%, when multiple automobile manufacturers entered the market offering a variety of HEV models. This tipping point coincided with the second generation Prius. Yet, today hybrids have just reached a 2.5-3% market share.

The hybrid experience represents the extreme challenges of introducing transformational drivetrain technology into the new motor vehicle fleet. EVs must not only travel the same early-stage adoption path as HEVs (which still rely on petroleum), but also face more substantial market barriers, such as concerns over range and the need to develop support infrastructure.

As reflected on the graph, the EV market is only in its infancy. It will require substantial support to overcome the barriers to broad market penetration and to ensure a solid and long-lasting foothold in the automotive marketplace. Projected market penetration rates for EVs and Plug-in Hybrid Electric Vehicles (PHEVs) vary significantly, demonstrating the market uncertainty surrounding these technologies. The Boston Consulting Group projects that EVs and PHEVs could make up 2% of new light-duty vehicle sales in 2020.<sup>4</sup> A study conducted by Google.org using McKinsey & Company's Low Carbon Economics Tool, on the other hand, projects that EVs and PHEVs could make up as much as 70% of new light-duty vehicle sales by 2030.<sup>5</sup> The

4. See The Boston Consulting Group, *Powering Autos to 2020: The Era of the Electric Car?*, at 18 (July 2011) ("BCG Study"), available at <http://www.bcg.com/documents/file80920.pdf>.

5. Google.org, *The Impact of Clean Energy Innovation: Examining the Impact of Clean Energy Innovation*

Google Study projection assumes rapid decreases in battery costs and increases in energy density by 2030, to enable the production of electric vehicles with 300-mile range and a total cost of ownership lower than that of conventional gasoline vehicles. *See* Google Study at 12. Without a breakthrough in battery technology, however, the Google Study concludes that it will be “much harder for EVs to reach scale.” *Id.* Thus far, though we have not yet reached ambitious sales targets, early signs of growth in the EV market, in particular in comparison with early sales of HEVs, are encouraging.<sup>6</sup>

The HEV experience and the EV market forecasts reflect the uncertainties surrounding the successful deployment of transformational drivetrain technologies beyond market innovators. Government incentives that help persuade consumers to adopt that technology will provide a strong foundation upon which to base that deployment and to redress the market barriers that may otherwise stall or limit a more expanded market for advanced vehicle technologies.

The build-out of electric vehicle charging infrastructure, particularly in commercial installations, is a critical part of this process of reaching the point of widespread consumer acceptance of EVs. In a 2010 Energy Initiative Symposium on Electric Vehicles, sponsored by MIT, some of the nation’s foremost experts on this topic agreed that the “[s]uccessful penetration of EVs into the transportation market requires consumer acceptance and infrastructure change as well as achieving competitive cost.”<sup>7</sup> The report, issued in connection with this event, highlighted that the most significant challenges associated with promoting increased use of EVs in the U.S. include:

- 1) that significant subsidies such as the current federal tax credit are required to keep EVs from being priced out of the market; and
- 2) that current charging infrastructure in the country is deficient or nonexistent and requires a major investment on the part of both the government and the private sector. *Id.*

## **Conclusion**

Nissan commends the committee for holding this hearing and soliciting comments on the importance of extending expiring tax provisions. We are committed to investing in a future of electric vehicles and appreciate your consideration of the U.S. Government’s role in helping to develop the U.S. market for EVs. As part of this effort, we believe that the continued availability of consumer credits for purchasing plug-in EVs, and the extension of the section 30C 30 percent credit for installing electric vehicle charging property, will help achieve the goal of widespread adoption in this country of electric vehicles. To be clear, Nissan is not suggesting that this credit should be extended permanently. To the contrary, Nissan believes that the section 30C credit should be extended only long enough to support development of the EV market to the tipping point beyond the early adopters stage of EVs. We appreciate your support of these incentives.

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*on the United States Energy System and Economy*, at 9 (July 2011) (“Google Study”), available at [http://www.google.org/energyinnovation/The\\_Impact\\_of\\_Clean\\_Energy\\_Innovation.pdf](http://www.google.org/energyinnovation/The_Impact_of_Clean_Energy_Innovation.pdf).

6. *See* <http://www.forbes.com/sites/pikerresearch/2012/04/05/who-says-electric-vehicles-arent-selling/>

7. *Ibid*, Note 1.